

Listing of Claims:

Claims 1-23 (Cancelled)

24. (Previously Presented) The method of claim 36, wherein the step of preheating is preceded by the steps of

discharging the destructed material into a conveyer at substantially atmospheric pressure;

conveying the discharged material into a storage bin at substantially atmospheric pressure; and

conveying material from the bin by a plug screw feeder through a pressure barrier in to the higher pressure environment where said step of preheating is performed.

Claims 25-35 (Cancelled)

36. (Currently Amended) A method for producing thermo-mechanical pulp in a primary disc refiner from lignocellulose fiber-containing chip feed material comprising the steps of:

first conditioning said fiber containing feed material while conveyed through a first chamber having an environment of saturated steam at an elevated pressure in the range of about 10-25 ~~psi~~ psig to produce conditioned feed material;

conveying and compressing the conditioned feed material through a second chamber having an environment of saturated steam at elevated pressure in the range

of about 10-25 ~~psi~~ psig to produce a pretreated material having destructured fibers without significant breakage across grain boundaries;

preheating the pretreated material in a third chamber in an environment of saturated steam at a pressure above 75 ~~psi~~ psig and above the glass transition temperature of the lignin in the material, for a period of time less than 30 seconds;

conveying the pre-heated material to the inlet of a primary disc refiner operating at a pressure above 75 ~~psi~~ psig and a temperature above the glass transition temperature of the lignin; and refining the material at a disc speed of rotation that is greater than 1500 rpm for a double disc refiner or greater than 1800 rpm for a single disc refiner.

37. (Previously Presented) The method of claim 36, wherein the conditioning of said feed material is performed for a period of time in the range of 3-60 seconds.

38. (Previously Presented) The method of claim 37, wherein the preheat time period is in the range of about 5-10 seconds.

39. (Previously Presented) The method of claim 36, wherein the preheat time period is 15 seconds or less.

40. (Previously Presented) The method of claim 39, wherein the conditioning of said feed material is performed for a period of time in the range of 3-60 seconds.